PB89-182497

Superfund Record of Decision (EPA Region 4) National Starch and Chemical Corp. Site Salisbury, Rowan County, North Carolina (First Remedial Action), September 1988

(U.S.) Environmental Protection Agency
Washington, DC

30 Sep 88

U.S. Department of Commerce
National Technical Information Service
NTIS

United States
Environmental Protection
Agency

Office of
Emergency and
Remedial Response

EPA/ROD/R04-88/039
September 1988

PB89-182497

EPA

Superfund Record of Decision:

National Starch, NC

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N O T I C E

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15. Supplementary Notes

16. Abstract (Limit: 200 words)

The National Starch and Chemical Corporation (NSCC) site is located in Rowan County, North Carolina, approximately five miles south of the city of Salisbury. The site consists of 500 acres and is occupied by the NCSS-owned Cedar Springs Road Plant which currently manufactures textile finishing and custom specialty chemicals. Land use adjacent to the site includes residential and industrial developments such as: warehousing operations on the east site; a farm on the south side; and residential areas bordering the southwest and north sides. Ground water in the aquifer beneath the site is currently used as a source of drinking water with the closest well being 2,200 feet northeast of the site. There are 1,539 homes within a 3-mile radius of the site that are outside of the city water lines and potential users of ground water for drinking and other domestic purposes. There is also potential for humans to directly contact or ingest contaminated waters through recreational uses of nearby creeks which receive the surface water runoff from the trench area. From 1971 to 1978, NSCC disposed of approximately 350,000 gallons of reaction vessel wash waters classified as D002 waste (corrosive waste with pH less than or equal to 2.0) in trenches constructed in a 5-acre tract of land located behind the plant. The waste consisted predominantly of salt brines, sulfuric acid solutions, sulfonating fats and oils, and solvents. The wastes

(See Attached Sheet)

17. Document Analysis a. Descriptors

Record of Decision
National Starch, NC
First Remedial Action
Contaminated Media: gw
Key Contaminants: metals, VOCs (TCE)

b. Identifiers/Open-Ended Terms

c. COSATI Field/Group

18. Availability Statement	19. Security Class (This Report) None	21. No. of Pages 3
	20. Security Class (This Page) None	22. Price

EPA/ROD/R04-88/039
National Starch, NC
First Remedial Action

16. ABSTRACT (continued)

were disposed of in several approximately 250 feet by 9 feet deep trenches running east/west and north/south. Trenches in this area also received liquid effluent from the plant where it percolated into the ground. After the percolation rate substantially declined, the trenches were backfilled and seeded. Site monitoring in 1976 and 1977 revealed shallow ground water contamination adjacent to or within the trench area. Consequently, the North Carolina Department of Natural and Economic Resources requested that NSCC cease onsite waste disposal activities. Since 1978, production plant process waters have been pretreated in a facility adjacent to and south of the production area and discharged to the Salisbury publicly owned treatment works (POTW). The two main areas of contamination identified at the site are the trench area and the wastewater lagoon area. This Record of Decision (ROD) will address remediation of ground water; a subsequent ROD will address soil contamination and, if necessary, sediment contamination. The primary contaminants of concern affecting the ground water, surface water, and sediments are VOCs including benzene, TCE, toluene and xylenes, and metals including arsenic and chromium.

The selected remedial action for this site includes: installation of a ground water interception and extraction system downgradient of the source area(s) with pretreatment prior to discharge to the POTW (pretreatment may include air stripping, filtration through an activated carbon filter, metal removal, or treatment through the company's existing lagoon system which includes presettling and surface aeration); and surface water and sediment monitoring. If the POTW declines to accept the treated ground water, it will be discharged to a local surface stream under an NPDES permit. The estimated present worth cost for this remedial action is $3,036,000 with annual O&M of $55,000.

1.a

ENFORCEMENT
RECORD OF DECISION
REMEDIAL ALTERNATIVE SELECTION

NATIONAL STARCH AND CHEMICAL CORP. ~~SITE~~
SALISBURY, ROWAN COUNTY
NORTH CAROLINA

PREPARED BY:

US ENVIRONMENTAL PROTECTION AGENCY
REGION IV
ATLANTA, GEORGIA

DECLARATION FOR THE RECORD OF DECISION

Site Name and Location

National Starch and Chemical Corporation
Salisbury, Rowan County, North Carolina

Statement of Basis and Purpose

This decision document represents the selected remedial action for the National Starch and Chemical Corporation Site, located in Salisbury, North Carolina, developed in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA) 42 U. S. C. Section 9601 et. seq., and to the extent practicable, the National Contingency Plan 40 CFR Part 300.

This decision is based upon and documented in the contents of the Administrative Record. The attached index identifies the items which comprise the Administrative Record. The State of North Carolina has concurred on the selected remedy.

Scope and Role of Operable Unit

This operable unit will address remediation of groundwater at the site as well as monitoring of surface water and sediments. On-site contaminated groundwater and possible off-site migration of contaminated groundwater, surface water, and sediments constitute a principal threat at the site. Groundwater remediation will meet cleanup goals throughout the plume(s), thereby removing the principal threat from potential on-site groundwater use or off-site migration. Further, groundwater remediation is expected to mitigate any potential off-site migration of contaminated sediments or surface water, since groundwater recharge is one suspected source of this contamination.

Soil contamination will be addressed in a subsequent Record of Decision. This subsequent "source control" operable unit will involve additional soil sampling in the vicinity of suspected source area(s). This sampling will determine if another source, other than the trench area, is responsible for the surface water/sediment contamination found, and will characterize soil contamination in such source area(s) for potential remediation. Contaminated sediments will also be addressed further, as necessary, in the source control operable unit. Potential off-site migration of contaminated sediments due to erosion and surface runoff, a suspected source of such contamination, will be addressed in this operable unit. The source control operable unit will address a principal threat from dermal contact or ingestion of contaminated soils or sediments.

Description of the Selected Remedy

The Remedial Action presented in this document is the first operable unit at the site. This operable unit will be consistent with final site remediation. Soil contamination will be addressed in a subsequent Record of Decision.

Groundwater

A groundwater interception and extraction system will be installed down gradient of the disposal area(s) and will effectively contain and remediate contaminated groundwater. The extracted groundwater will be discharged to the Salisbury POTW. The level and degree of pretreatment of the extracted groundwater will depend on the effluent limits set by the POTW. The range of pretreatment for the extracted groundwater includes air stripping, filtration through activated carbon filter, treatment to remove metals, and treatment through the company's existing lagoon system to meet POTW influent standards. Groundwater remediation will be performed until all contaminated water meets the cleanup goals specified in the attached Summary of Alternative Selection.

If the POTW declines to accept the extracted groundwater, treated or untreated, then the extracted groundwater will be discharged to a local surface stream under a National Pollutant Discharge Elimination System (NPDES) permit.

Surface Water

A monitoring program for surface water and sediments will be included and initiated as part of the Remedial Design stage. Additional soil samples will be collected in the vicinity of surface waters and suspected surface area(s), in part to determine if another source, other than the trench area, is responsible for the surface water/sediment contamination found. Contaminated sediments, if necessary, will be addressed further in the subsequent soil operable unit. The surface water/sediment monitoring will continue until remediation goals are achieved.

Declaration

The selected remedy is protective of human health and the environment, attains Federal and State requirements that are applicable or relevant and appropriate for this remedial action, and is cost-effective. This remedy satisfies the preference for treatment that reduces toxicity, mobility, or volume as a principle element. Finally it is determined that this remedy utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable to address the principal threats from groundwater contamination at the site.

Patrick M Tobin for

Greer C. Tidwell
Regional Administrator

9-30-88
Date

SUMMARY OF REMEDIAL ALTERNATIVE SELECTION

NATIONAL STARCH AND CHEMICAL CORP. SITE
SALISBURY, ROWAN COUNTY, NORTH CAROLINA

PREPARED BY:

U.S. ENVIRONMENTAL PROTECTION AGENCY
REGION IV
ATLANTA, GEORGIA

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ENFORCEMENT
RECORD OF DECISION
SUMMARY OF REMEDIAL ALTERNATIVE SELECTION
NATIONAL STARCH & CHEMICAL CORP. SITE
SALISBURY, ROWAN COUNTY, NORTH CAROLINA

1.0 INTRODUCTION

The National Starch and Chemical Corporation Site was proposed for inclusion on the National Priorities List (NPL) in April 1985 and reproposed in June 1988. The National Starch Site has been the subject of a Remedial Investigation (RI) and Feasibility Study (FS) performed by the responsible party, National Starch, under an Administrative Order by Consent dated December 1, 1986. The RI report, which examines air, sediment, soil, surface water, and groundwater contamination at the site was completed on June 21, 1988. The FS, which develops and examines alternatives for remediation of the site, was issued in draft form to the public on September 3, 1988.

The Record of Decision has been prepared to summarize the remedial alternative selection process and to present the selected groundwater remedial alternative.

1.1 SITE LOCATION AND DESCRIPTION

The National Starch and Chemical Corporation Site is located in Rowan County, North Carolina, approximately five miles south of the city of Salisbury (Figure 1). Salisbury is located about 40 miles northeast of Charlotte, North Carolina. According to 1986 statistics, Rowan County covers 517 square miles with a population of 104,678. The population of the city of Salisbury as of 1986, is 23,931.

In general, land use of the areas immediately adjacent to the site is a mixture of residential and industrial developments (Figure 2). The east side of the site, on the opposite side of Cedar Springs Road, is an industrial park primarily consisting of warehousing operations. A farm is adjacent to the south side of the site. Grants Creek forms the western boundary of the site. The Little Acres Mobile Home Subdivision adjoins the extreme southwestern corner of the site. A housing development, Kings Forest, is adjacent to the north side of the site. The site actually forms the east, west, and south boundaries of the development, such that the site is adjacent to the backyards of a number of homes in the development. A second development, Stonybrook, lies across Airport Road on the northern side of the site.

The Rowan County airport is located to the northeast of the site and the Rowan County Landfill to the north of the airport.

The National Starch and Chemical Corporation owns a 500 acre industrial site known as the Cedar Springs Road Plant. Current information indicates that

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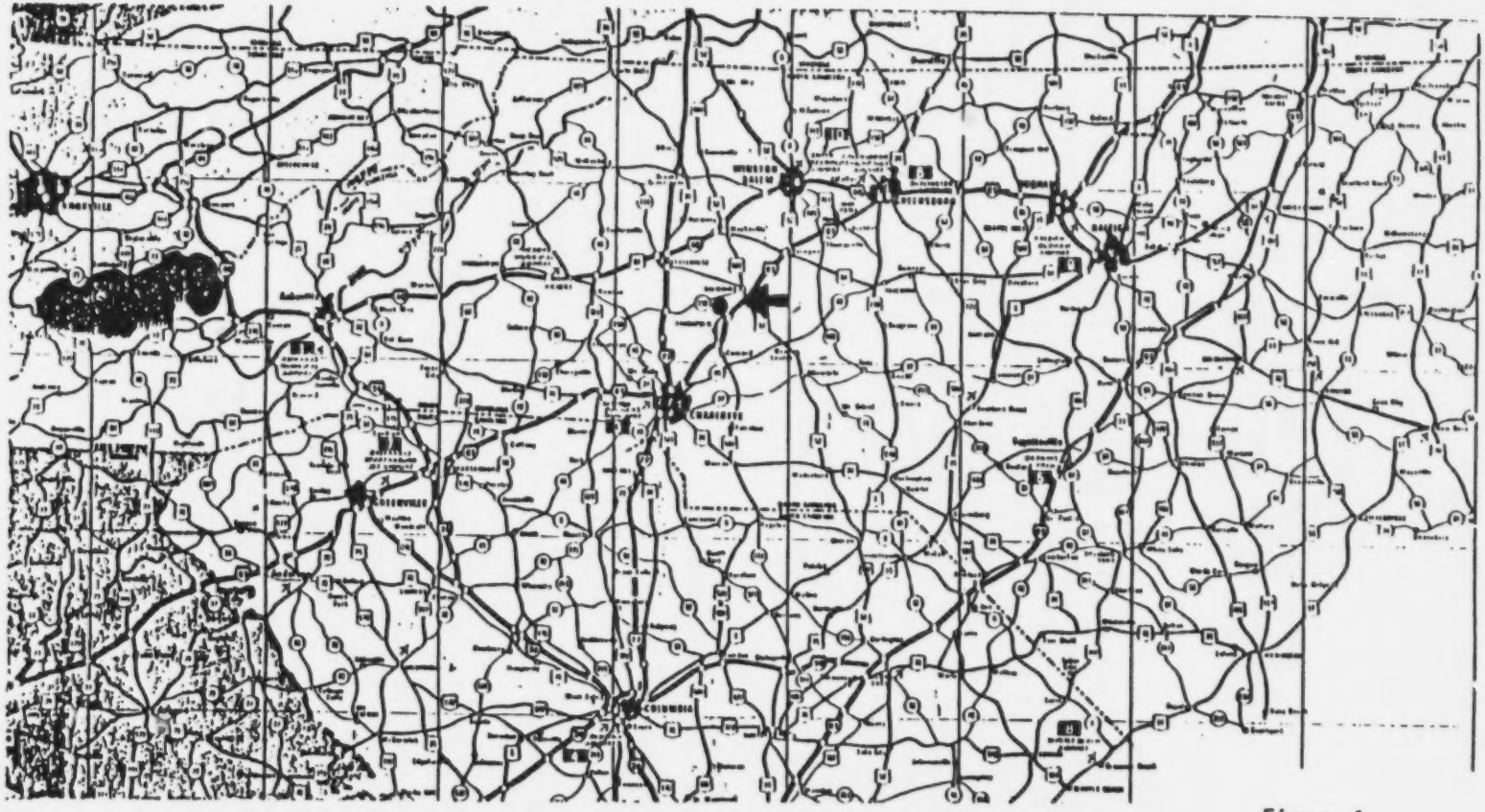


● Cedar Springs Road Plant

Figure 1
Vicinity Map
Cedar Springs Road Plant

NATIONAL STARCH SITE

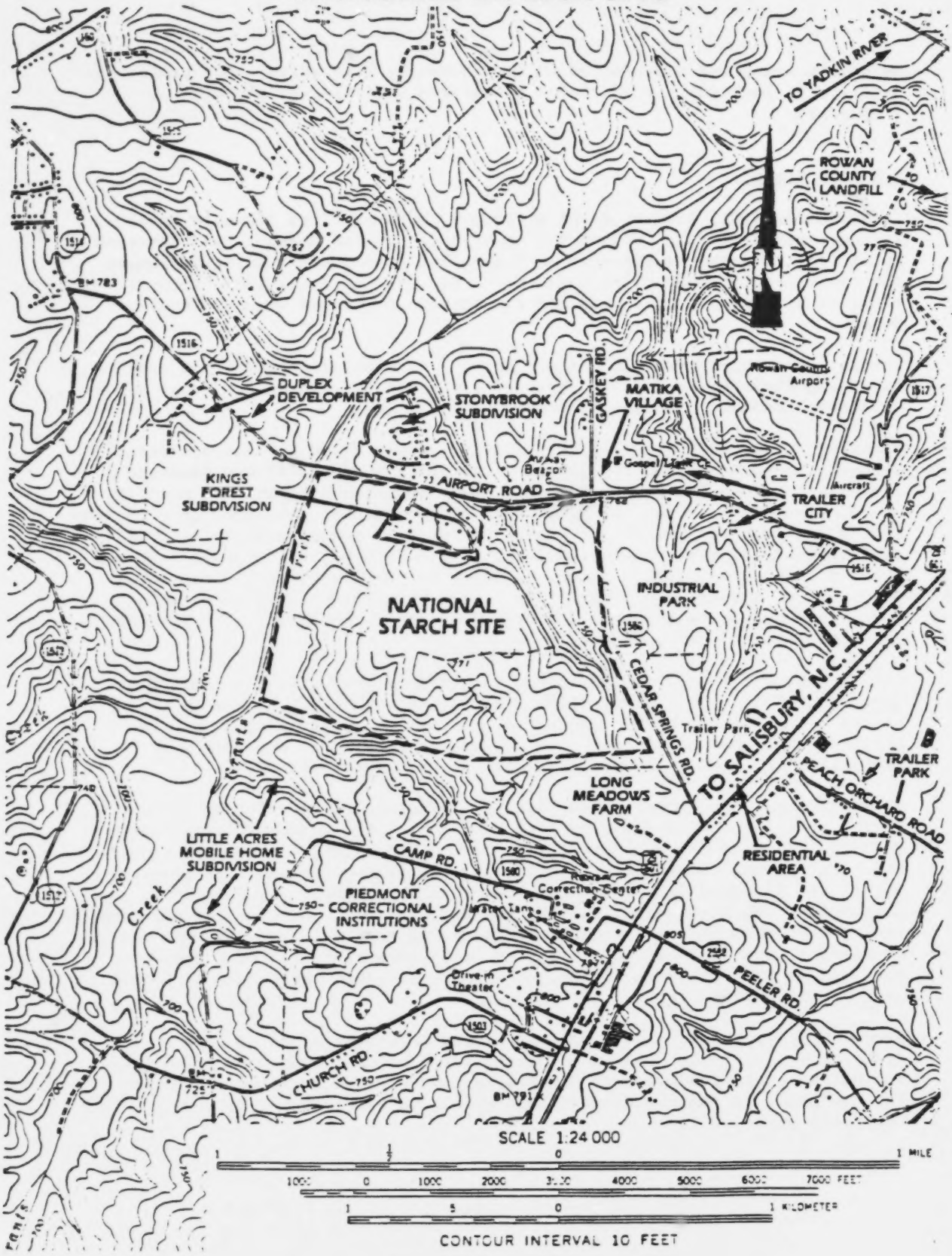


FIGURE 2

hazardous waste was disposed of on approximately five acres. The production facility is located in the extreme southeastern portion of the site (Figure 3).

1.2 Site History

In September 1968, Proctor Chemical Company purchased the 465-acre Cedar Springs Road property. Within the next year, Proctor Chemical was acquired by National Starch and operated as a separate subsidiary. Construction of the Cedar Springs Road plant began in 1970. On January 1, 1983, Proctor Chemical Company was dissolved and its operations merged with National Starch.

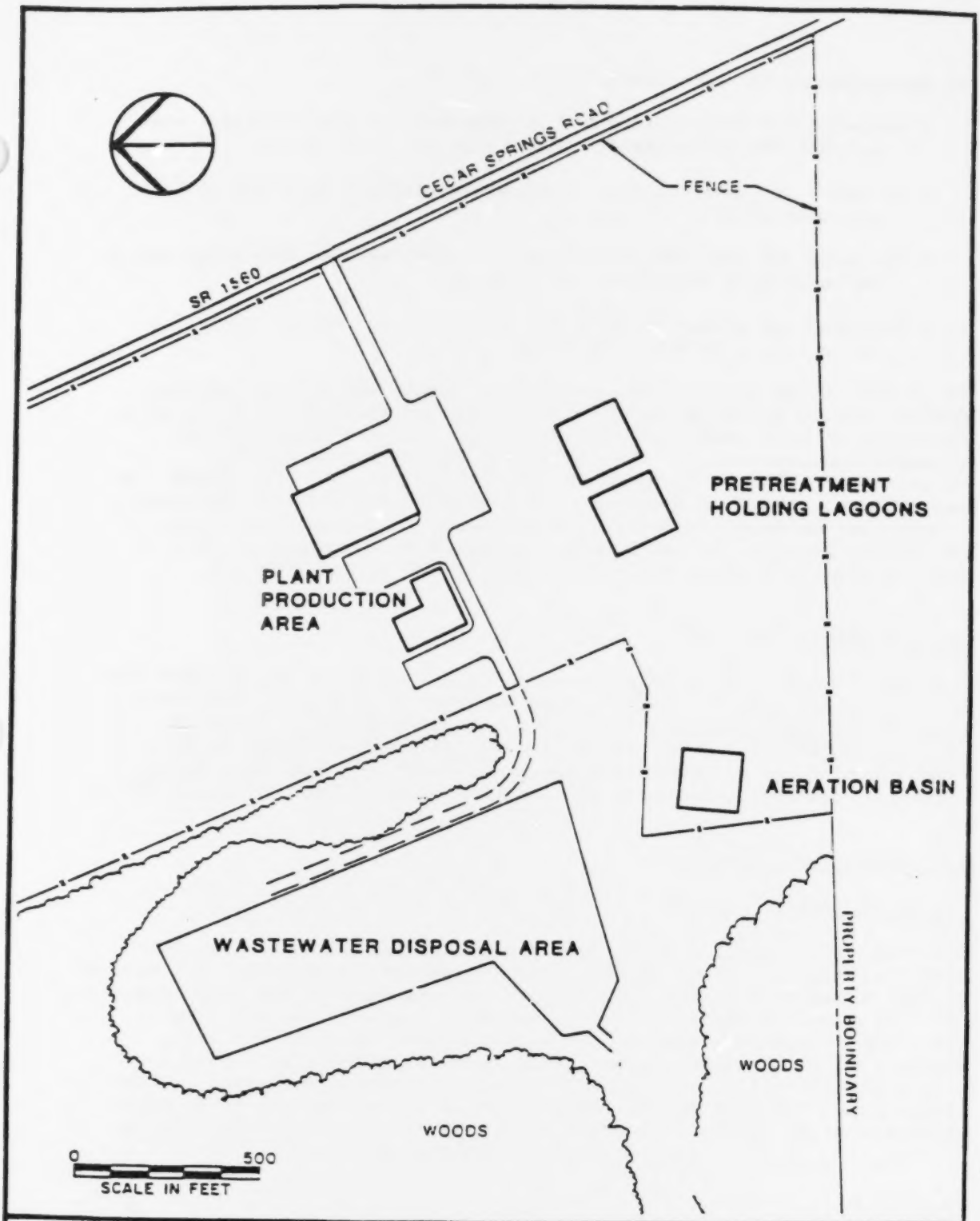
The National Starch facility is primarily a manufacturing plant for textile finishing chemicals and custom specialty chemicals. Production takes place on a batch basis and varies depending upon demand.

Based on a 1984 CERCLA 103(c) notification report filed by National Starch & Chemical Corporation (NSCC), from 1971 to 1978, National Starch disposed of approximately 350,000 gallons of D002 waste (corrosive waste with pH $\leq$2.0) reaction vessel wash waters in trenches constructed in a 5-acre tract of land located behind the plant. The corrosive reaction vessel wash water consisted predominantly of salt brines, sulfuric acid solutions, sulfonating fats and oils, and solvents. Trace levels of heavy metals may be due to deminimus corrosion of process equipment. The wastes were disposed of in several trenches approximately 200 to 300 feet long and 8 feet deep. The trenches ran both east to west and north to south.

Liquid effluent from the plant production area flowed into the easternmost pretreatment holding lagoon, which was unlined, and then was pumped to an active trench in the trench area. Each trench was used until liquid no longer readily percolated into the ground. Afterwards the trench was backfilled and seeded, and a new trench was constructed.

In 1976, eight monitoring wells were installed around the site by National Starch to determine if the trenching operations were impacting groundwater quality. Four of these monitoring wells were installed adjacent to or within the trench area. Monitoring revealed that shallow groundwater immediately within and adjacent to the trench area was contaminated. In June 1977, sampling by the North Carolina Department of Natural and Economic Resources, Division of Environmental Management (DEM) verified National Starch's earlier conclusion that some of the monitoring wells were contaminated. Based on analysis of samples taken at that time, DEM requested that National Starch cease onsite waste disposal activities.

Since 1978, production plant process waters have been directed to a pretreatment facility located adjacent to and south of the production area. The waste stream goes through presettling and surface aeration in holding lagoons prior to controlled discharge to the Salisbury publicly owned treatment works (POTW).



SITE MAP

FIGURE NO. 3

The objectives of the site investigation were to:

* Determine the nature and extent of groundwater, surface water, soil, and sediment contamination on and adjacent to the site.

* Determine the attentuative and adsorptive properties of the shallow saturated media.

* Determine and describe on-site and off-site features that could affect the methods of containment or cleanup.

* Determine the extent to which the site posed an imminent hazard to public health or the environment.

The purpose of the feasibility study was to develop and examine remedial alternatives for the site, and to screen these alternatives on the basis of protection of human health and the environment, cost-effectiveness and technical implementability. In accordance with the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), alternatives in which treatment would permanently and significantly reduce the volume, toxicity, or mobility of the hazardous substances at the site were preferred over those alternatives not involving such treatment.

2.0 ENFORCEMENT ANALYSIS

The National Starch Site was proposed for inclusion to the NPL in April 1985 and EPA assumed lead responsibility for the site at that time. The current owner and operator, National Starch and Chemical Corporation agreed to perform the RI/FS. A notice letter was sent to National Starch on May 30, 1986. Negotiations for the RI/FS Consent Agreement were concluded with the signing of the document by both EPA and National Starch on December 1, 1986.

3.0 CURRENT SITE STATUS

3.1 HYDROGEOLOGIC SETTING

The geologic framework of Rowan County forms two distinct aquifers. The first is a shallow aquifer created by the saprolite. The second is a bedrock aquifer formed by the crystalline rocks. The two aquifers are interconnected with the clay-rich saprolite aquifer acting as a storage reservoir for the lower crystalline rock aquifer. As a result, both the upper and lower aquifers can be considered unconfined despite the tendency of water levels within the crystalline rock aquifer to display artesian conditions. Water levels within the deep aquifer tend to rise to levels near the upper water table across the county, indicating a hydraulic connection between the two.

Well yields are low within the upper aquifer and tend to range between 3 to 5 gallons per minute. Successful wells drilled within the bedrock aquifer generally have higher yields than those in the saprolite aquifer and average approximately 40 to 50 gallons per minute.

Grants Creek delineates the western most property line and flows in a northeasterly direction. Grants Creek flows approximately 12 miles beyond the National Starch property before reaching the Yadkin River. It joins the Yadkin River approximately 2 miles below the water supply intake for the City of Salisbury. Sheet surface runoff, concentrated toward the middle of the former trench area, carries surfacial drainage from the trench area.

Three unnamed tributaries of Grants Creek traverse the National Starch site. The first stream passes within 200 yards of the front of the plant (the eastern tributary), paralleling Cedar Springs Road and leaves the property to the north. A small intermittent stream forms the southwestern site boundary (the southwestern tributary). The USGS quadrangle indicates a third small stream positioned in the northwest quadrant of the property (the northwest tributary). Grants Creek and the unnamed tributaries receive the surface water runoff from the former trench area.

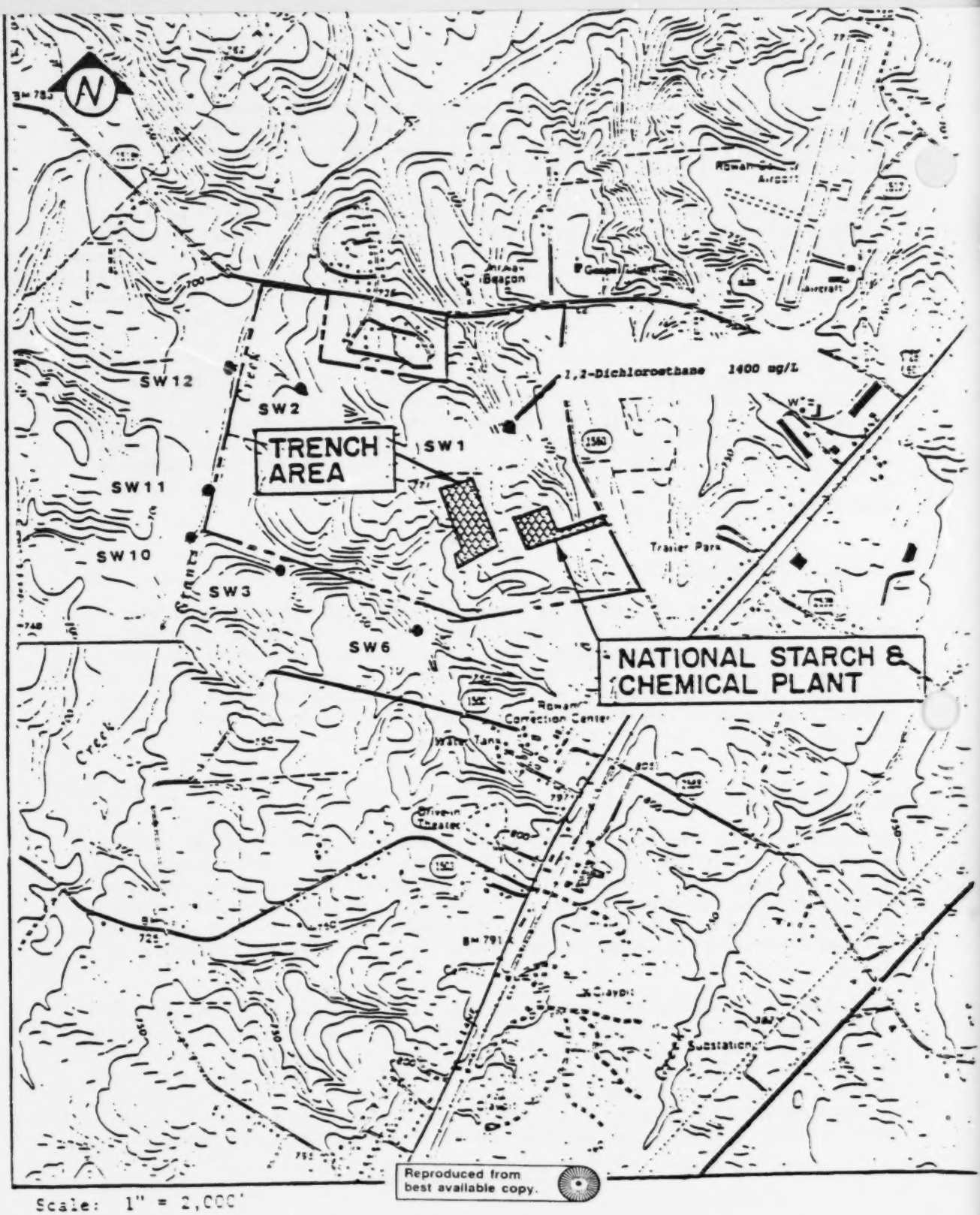
3.2 SITE CONTAMINATION

The National Starch Site contains two main identified contaminant areas: the trench area and the wastewater lagoon area. Soil, groundwater, surface water, and sediment samples were collected in and around each of the two areas and analyzed. All samples were analyzed for those chemicals included on the Hazardous Substances List (HSL). These include organic volatiles, pesticides, organic semivolatiles, polychlorinated biphenyls (PCBs), and metals.

SURFACE WATER/SEDIMENT

The surface water sampling locations are shown on Figure 4 and the sediment sampling locations are shown on Figure 5. The results of the analyses are given in Table 1. In addition, EPA took additional surface water/sediment samples from an eastern tributary in response to nearby residents' complaints (Figure 6). Table 2 shows the results of EPA's sampling activities. Both studies revealed high levels of contamination in the eastern tributary on site.

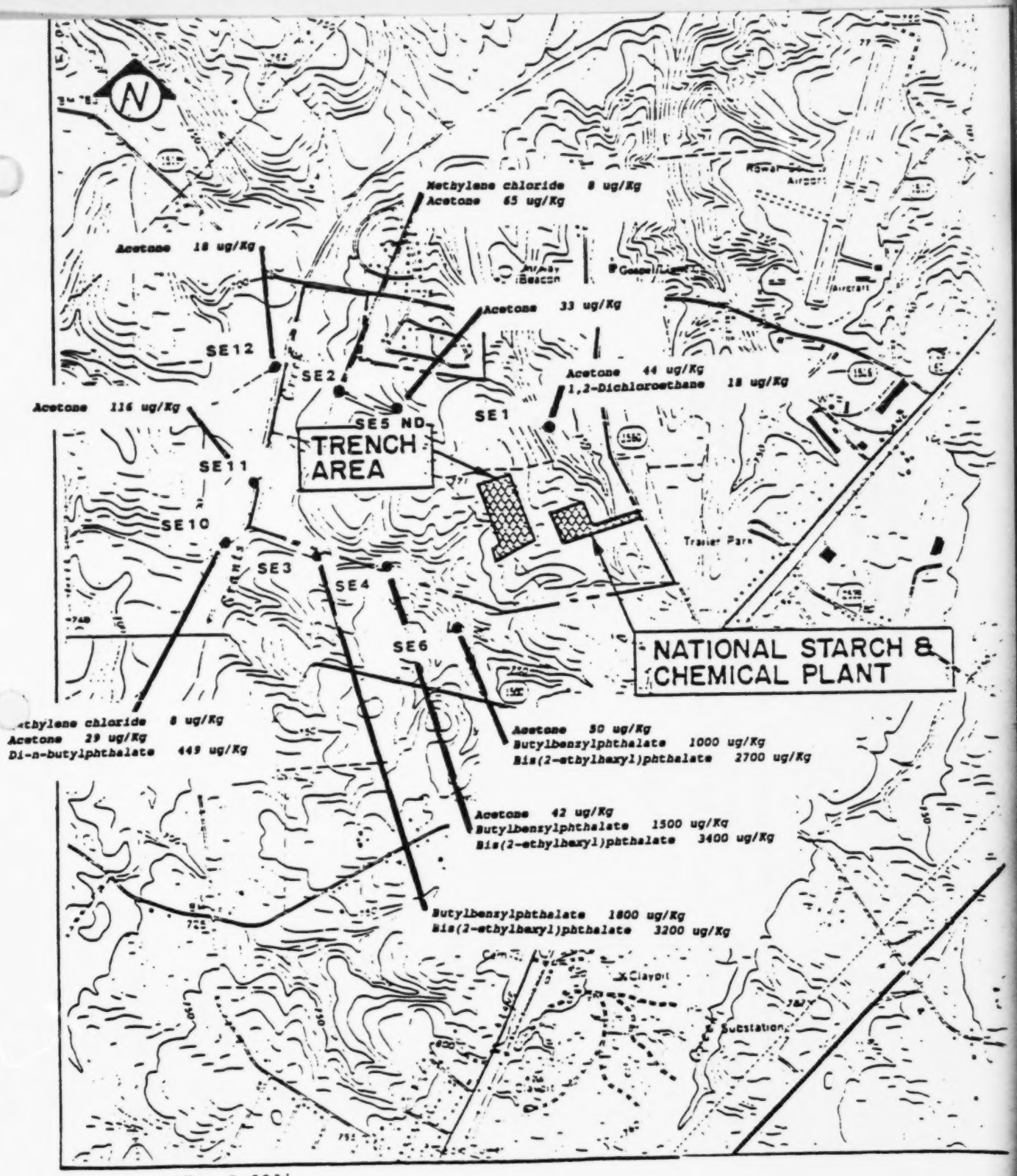
The source of contamination in the surface water has not been identified; neither surface water runoff or groundwater discharge has been ruled out as a potential source. Additional sampling will be conducted during the supplemental RI for the soil remediation operable unit to determine if other source area(s) exist on the National Starch property, and to determine the related extent of migration of contamination. This supplemental RI will occur concurrently with the Remedial Design stage of the first operable unit.



Scale: 1" = 2,000'

SURFACE WATER SAMPLING LOCATIONS

FIGURE 4



SEDIMENT SAMPLING LOCATIONS

FIGURE 5

Table 1 Surface Water/Sediment Organic Analytical Data Summary
National Starch and Chemical Corporation RI/FS
Date of Sampling - March 1987

	Methylene chloride	Acetone	1,2-dichloro-ethane	Butylbenzyl-phthalate[a]	Bis(2-ethylhexyl)-phthalate[a]	Di-n-butyl-phthalate[a]
SE1	-	44(7)	18(7)	-	-	-
SW1	-	-	1400(50)	-	-	-
SE2	8(7)	65(7)	-	-	-	-
SW2	-	-	-	-	-	-
SE3	-	-	-	1800(440)	3200(440)	-
SW3	-	-	-	-	-	-
SE4	-	42(8)	-	1500(520)	3400(520)	-
SE5	-	33(9)	-	-	-	-
SE6	-	50(6)	-	1000(410)	2700(410)	-
SW6	-	-	-	-	-	-
SE10	8(6)	29(6)	-	-	-	449(430)
SW10	-	-	-	-	-	-
SE11	-	116(6)	-	-	-	-
SW11	-	-	-	-	-	-
SE12	-	18(7)	-	-	-	-
SW12	-	-	-	-	-	-

[a]Suspected of representing sampling error.

SE - µg/kg
SW - µg/l
( ) represents detection limit

FIGURE 6
NATIONAL STARCH
CEDAR SPRINGS ROAD SITE
SAMPLING LOCATIONS
JUNE 17, 1987

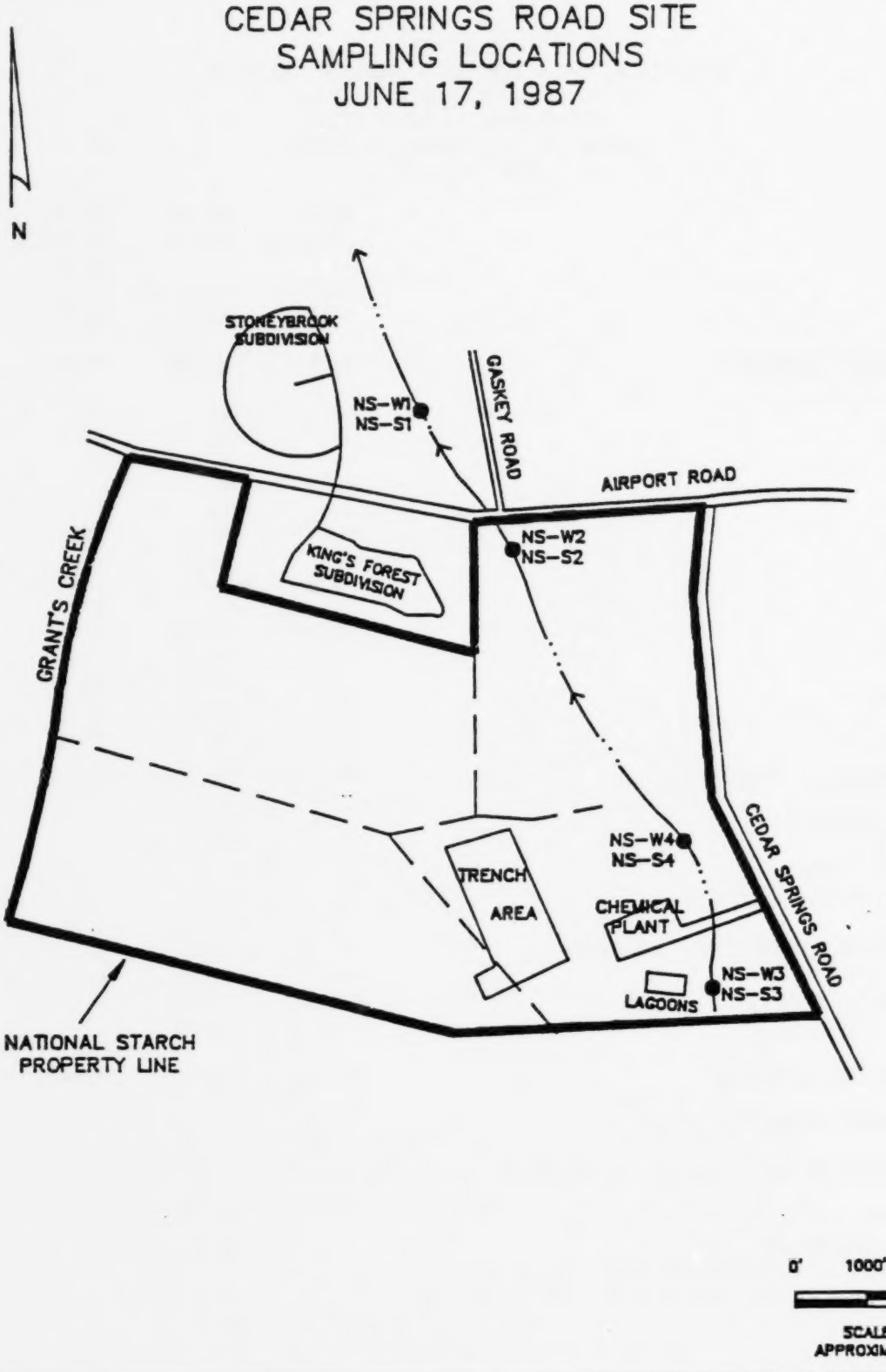


TABLE 2
ANALYTICAL DATA SUMMARY - SEDIMENT SAMPLES
NATIONAL STARCH AND CHEMICAL
CEDAR SPRINGS ROAD SITE
ROWAN COUNTY, NORTH CAROLINA
JUNE 17, 1987

	NS-S3 CONTROL	NS-S4 FENCE	NS-S2 AIRPORT ROAD	NS-S1 MENSTER PROPERTY
	06/17/87 1700	06/17/87 1735	06/17/87 1545	06/17/87 1420
INORGANIC ELEMENT/COMPOUND	MG/KG	MG/KG	MG/KG	MG/KG
BARIUM	40	49	37	52
CHROMIUM	31	71	58	44
COPPER	34	62	30	21
NICKEL	7.5	--	--	--
STRONTIUM	14	13	17	13
TITANIUM	520	860	590	550
VANADIUM	140	240	140	98
YTTRIUM	16	7.8	6.8	5.7
ZINC	18	43	22	23
ALUMINUM	11000	22000	10000	8500
MANGANESE	150	640	470	490
CALCIUM	1300	1300	3900	2500
MAGNESIUM	610	1000	2200	1900
IRON	22000	61000	34000	25000
EXTRACTABLE ORGANIC COMPOUNDS	UG/KG	UG/KG	UG/KG	UG/KG
HEXACHLOROBUTADIENE	--	400J	--	--
BENZOIC ACID	520J	--	--	--
PETROLEUM PRODUCT	N	--	--	--
2 UNIDENTIFIED COMPOUNDS	--	3000J	--	--
BIPHENYL	--	100JN	--	--
BIS(PHENYLMETHYL)BENZENEMETHANAMINE	--	700JN	--	--
DIPHENYLETHANEDIONE	--	200JN	--	--
HEXADECANOIC ACID	1000JN	900JN	--	--
OXYBISBENZENE	--	200JN	--	--
PURGEABLE ORGANIC COMPOUNDS	UG/KG	UG/KG	UG/KG	UG/KG
1,2-DICHLOROETHANE	--	3400JN	--	--

****

FOOTNOTES
J - ESTIMATED VALUE
N - PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
-- - MATERIAL WAS ANALYZED FOR BUT NOT DETECTED

TABLE 2 (continued)
ANALYTICAL DATA SUMMARY - WATER SAMPLES
NATIONAL STARCH AND CHEMICAL
CEDAR SPRINGS ROAD SITE
ROWAN COUNTY, NORTH CAROLINA
JUNE 17, 1987

	NS-W3 CONTROL	NS-W4 FENCE	NS-W2 AIRPORT ROAD	NS-W1 MEYSTER PROPERTY
	06/17/87 1655	06/17/87 1730	06/17/87 1539	06/17/87 1402
INORGANIC ELEMENT/COMPOUND	UG/L	UG/L	UG/L	UG/L
BARIUM	32	21	46	47
STRONTIUM	63	110	310	280
TITANIUM	40	--	--	--
VANADIUM	15	--	--	--
ALUMINUM	3100	230	200	210
MANGANESE	200	160	--	--
	MG/L	MG/L	MG/L	MG/L
CALCIUM	6.8	13	31	28
MAGNESIUM	3.3	5.4	13	12
IRON	3.5	1.1	0.39	0.31
SODIUM	4.2	13	9.6	9.2
[I]TABLE ORGANIC COMPOUNDS	UG/L	UG/L	UG/L	UG/L
ETHYLHEXANOIC ACID	--	4JN	--	--
PHOSPHORIC ACID, TRIETHYL ESTER	--	25JN	--	--
(DIMETHYLETHYL)PROPENAMIDE	--	3JN	20JN	--
(DIMETHYLETHYL)PROPENAMIDE (2 ISOMERS)	--	--	--	20JN
1 UNIDENTIFIED COMPOUND	--	100J	50J	40J
[P]RGEABLE ORGANIC COMPOUNDS	UG/L	UG/L	UG/L	UG/L
1,2-DICHLOROETHANE	--	4400J	--	--

****

*FOOTNOTES***
J - ESTIMATED VALUE
N - PRESUMPTIVE EVIDENCE OF PRESENCE OF MATERIAL
-- - MATERIAL WAS ANALYZED FOR BUT NOT DETECTED

GROUNDWATER

During the remedial investigation, 23 monitoring wells were installed; 17 shallow wells to sample water in the saprolite and six deep wells to sample water from the bedrock aquifer. Locations of the wells are shown on Figure 7 and the sampling results are given in Table 3.

Data collected from the groundwater wells indicated that the two water-bearing zones (shallow and deep) are interconnected.

Three areas were targeted for groundwater investigation at this site: the wastewater treatment lagoons, the area just west of the plant between the plant and trench area (where soil from wastewater lagoon retrofitting was stockpiled and aerated, releasing volatile organics to the atmosphere) and the trench area.

The data from the groundwater wells in the vicinity of the stockpile area and the wastewater treatment lagoons did not show any impact on groundwater.

The groundwater in the trench area was found to be highly contaminated. Contaminants, mostly in the form of volatile and base neutral organics, are present in both the saprolite and bedrock aquifers.

3.3 Summary of Site Risks

CERCLA directs that the Agency must protect human health and the environment from current and potential exposure to hazardous substances at the site. In order to assess the current and potential risks from this site, a risk assessment was conducted as part of the Remedial Investigation. This section summarizes the Agency's findings concerning the risks from exposure to groundwater related to this site.

Eleven carcinogens and fourteen non-carcinogens have been identified in the groundwater at this site. The toxicity, mobility and persistence characteristics of these substances at the site do not warrant the exclusion of any of these substances from consideration as chemicals of concern at this site. The substances of concern for this site are listed in Table 4. This table also presents the highest detected on-site levels for these substances, as well as other related health information.

3.3.1 Exposure Assessment

Groundwater in the area is a current source of drinking water; it is classified as Class IIA based on the Agency's Groundwater Classification Strategy. A 1988 survey of existing off-site water supply wells revealed a total of 1,539 homes within a 3-mile radius of the site that are outside the limits of the city water lines and could potentially use the groundwater for drinking and other domestic purposes. The closest well is located 2,200 feet northeast of the site.

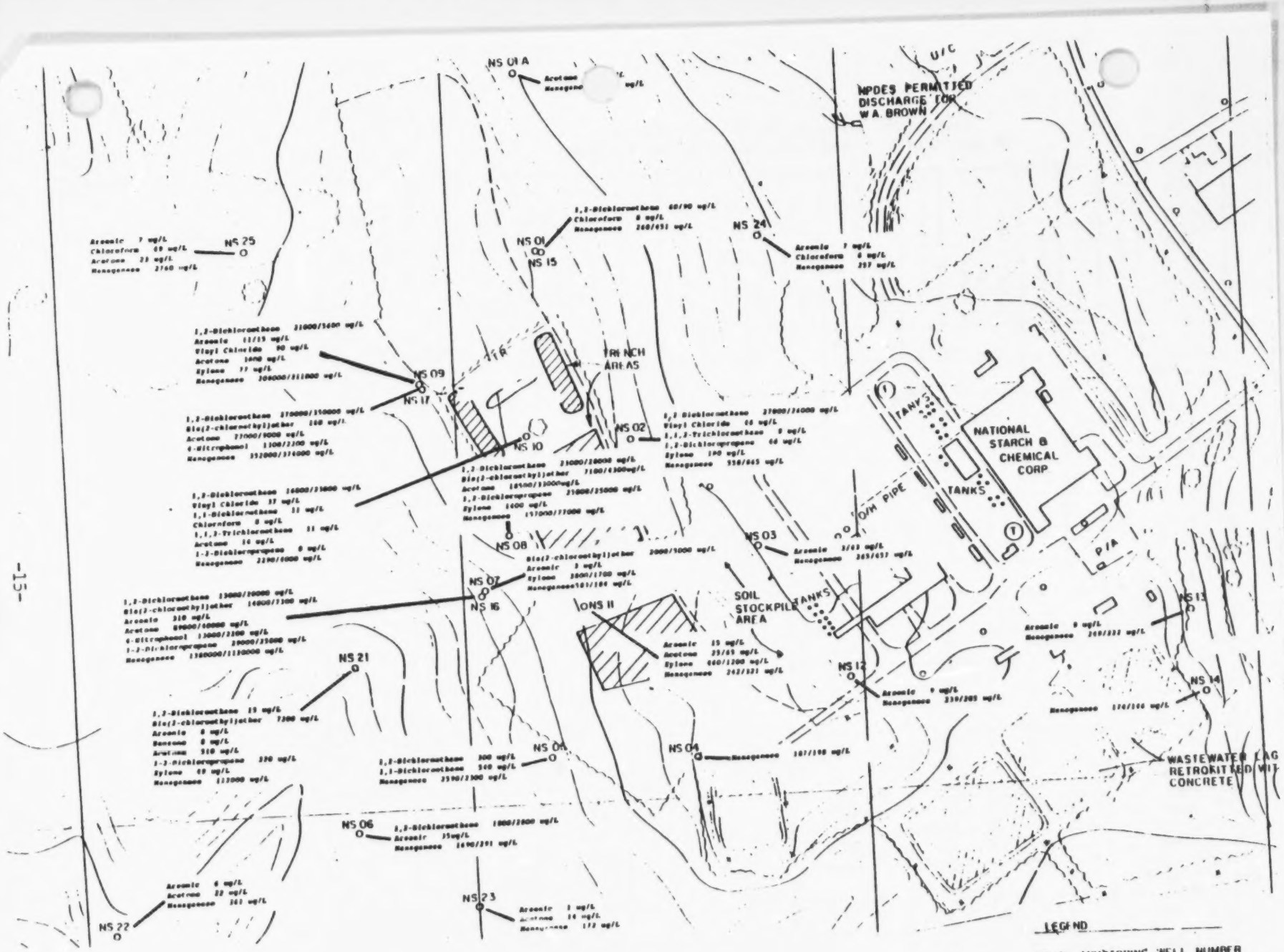


FIGURE 7

GROUNDWATER SAMPLING LOCATIONS AND ANALYTICAL RESULTS

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TABLE 3

NATIONAL STARCH & CHEMICAL CORP. RI/FS GROUND WATER DATA SUMMARY

(All concentrations in ug/l except chloride (mg/l), pH, and specific conductance.)

Well No.	1,2 Dichloroethane	Bis(2-chloroethyl)ether	Arsenic	Vinyl Chloride	1,1 Dichloroethane	Chloroform	1,1,2 Trichloroethane	Benzene	Acetone	Cadmium	4-Nitrophenol	Beryllium	1,2 Dichloropropane	Xylene	Manganese	Nickel	Selenium	Zinc	pH	Specific Conductance	Chloride
01A									21	5		1			377	31	12	25	6.14	726	2
02	27000			86			9						46	180	558	25		33	5.96	1862	330
	26000														865	21		28	5.57	1100	370
03			3												265			65	5.67	16	1.3
			83												657			73	5.95	16.9	6.3
04															187			16	5.58	52	2.4
															198	17		65	5.66	69	2
05															2590	74			6.23	570	110
	300				580										2300			243	5.84	614	100
06	1800		35												1690	61		117	5.90	377	50
	2800														291			14	5.73	442	60
07		2000	3											3800	583	16		61	7.13	2571	550
		5000							250					1700	184			14	7.68	2820	460
08	23000	7100							18500			17	25000		157000	321	102	1670	6.28	36015	8700
	28000	6300							33000			2	25000	1400	77000	166		850	6.58	35200	8800
09	21000		11	90					3800					77	200000	153		122	5.86	37600	8500
	5600		15												211000	92		142	6.06	11100	4400
10	16000			37	11	8	11		14				8		2290	35		84	5.89	1455	530
	23000		3												1000	87		113	5.76	2610	820
11									25					160	282				7.58	1154	61
			15						65					1200	321	25		61	7.38	1020	75

TABLE 3 (Continued)

NATIONAL STARCH & CHEMICAL CORP. RI/FS GROUND WATER DATA SUMMARY

(All concentrations in ug/l except chloride (mg/l), pH, and specific conductance.)

Well No.	1,2 Dichloroethane	Bis(2-chloroethyl)ether	Arsenic	Vinyl Chloride	1,1 Dichloroethane	Chloroform	1,1,2 Trichloroethane	Benzene	Acetone	Cadmium	4-Nitrophenol	Beryllium	1,2 Dichloropropane	Xylene	Manganese	Nickel	Selenium	Zinc	pH	Specific Conductance	Chloride
															239	12		65	6.55	66	3
12																					
															205	20		33	5.86	6.6	6
			9																		
															249	17		73	7.02	662	7.3
13			9																		
															222			67	6.67	662	7
															174	19		66	6.36	90	6
14																					
															146		2	24	6.29	91	3.3
															260			87	6.79	376	56
*15	60					8															
															651			5	7.10	662	90
	90																				
									89000	77	13000	120	29000		1380000	5190		14900	3.53	92748	25000
*16	13000	16000																			
									60000	114	2200	71	25000		1120000	3270		10300	3.57	11600	31000
	20000	7300	310 E																		
									77000	44	1300				352000	1360		798	5.27	107050	53000
*17	276050																				
									9000	49	2200	3			374000	798	274	566	6.12	111000	22000
	350000		160																		
									510	5		1	220	69	112000	20	4	5	6.12	5770	1900
*21	15	7200	8					8													
									22	5		1			361	20	3	5	6.83	116	6.5
22			6																		
									14	5		1			172	20	4	8	6.13	110	8.5
23			1																		
										5		1			257	20	12	5	7.00	838	180
*24			7			6															
									23	5		2			2760	60	20	374	7.07	150	4.16
*25			7			69															

NOTES:

* Denotes deep wells.

Blanks denote non-detectable concentrations.

For samples with two entries -- first sampling date was April 30, 1987; second date, July 23, 1987.

For samples with [illegible]ry -- sampling date was September 3, 1987.

E Denotes that the reported value has been estimated because of the presence of a matrix interference.

In developing the hypothetical exposure scenarios for groundwater at this site, it was assumed that nearby residents would be exposed to water contaminated at the highest concentrations found on site. This is a reasonable assumption based on the facts that residences are located almost directly along the site boundaries in the direction of apparent groundwater flow, and because the data indicate that the groundwater plume is advancing rapidly.

The potential routes of human exposure relative to the groundwater include water used for drinking and other domestic purposes. Relative to the surface waters, there is a potential for humans to directly contact or ingest contaminated waters through recreational uses of nearby creeks.

3.3.2 Toxicity Assessment

Eleven carcinogens and fourteen non-carcinogens were identified in the groundwater at this site. These substances are listed in Table 4. For the carcinogens, this table also lists the concentration for each substance which is equivalent to a 10^{-6} risk. The Agency considers individual excess cancer risks in the range of 10^{-4} to 10^{-7} as protective; however, the 10^{-6} risk level is used as the point of departure for setting cleanup levels at Superfund sites. A 10^{-6} level is particularly appropriate as a point of departure at this site given the number of carcinogens that nearby residents may be exposed to from the site.

For non-carcinogens, the concentration which would be equivalent to either the reference dose (R_fD) or the acceptable chronic intake (ACI) for that substance is listed in that table. The R_fD and ACI are levels to which humans can be exposed to on a daily basis without adverse effect. Exposures which exceed concentrations equivalent to these RfDs and ACIs would be considered an unacceptable risk at this site.

3.3.3 Summary of Risk Characterization

Given the proximity of the residents to the site boundary (particularly those residences in the King's Forest Subdivision and the Little Acres Trailer Court) and the rapid advancement of the groundwater plume, the risks from current and potential exposure to contaminated groundwater from this site are unacceptable. Future operable units for this site will deal with the risks associated with exposure to contaminated surface water, sediments, soil and air from this site; the risks to human health and the environment will be further assessed in the investigation for those operable units.

4.0 CLEANUP CRITERIA

4.1 GROUNDWATER

Based on the risks to human health described in the section 3.3 above, protective cleanup goals must be set for the chemicals of concern in the groundwater. The cleanup levels for these substances are set at the Maximum Contaminant Level (MCL) or, if an MCL is not currently available, at the limit of detection for that substance. Therefore, the following levels must be achieved throughout the plume(s) in order to protect human health at this site:

Arsenic 10 ppb
Benzene 5 ppb
Bis (2-chloroethyl ether) 5 ppb
Bromodichloromethane 5 ppb
Chloroform 5 ppb
1,2-dichloroethane 5 ppb
1,1-dichloroethylene 7 ppb
Methylene chloride 5 ppb
1,1,2-trichloroethane 5 ppb
Trichloroethylene 5 ppb
Vinyl chloride 2 ppb

In addition, cleanup goals are being set for the fourteen non-carcinogens identified at the site. These levels will be set at the MCL. If an MCL is not available, the level will be set at the R_fD or ACI equivalent concentration levels. However, in the case of ethyl benzene, the cleanup criterion is based on the proposed Maximum Contaminant Goal which is a health-based goal that takes into account recent data. Therefore, the following levels must be met throughout the plume(s) at this site in order to protect human health:

Acetone 3,500 ppb
Barium 1,000 ppb
Beryllium 17.5 ppb
Cadmium 10 ppb
Chromium 50 ppb
1,2-Dichloropropane 6 ppb
Ethyl benzene 3,500 ppb
Manganese 7,700 ppb
Nickel 350 ppb
4-Nitrophenol 350 ppb
Selenium 10 ppb
Toluene 2,000 ppb
Xylenes 350 ppb
Zinc 7,350 ppb

The cleanup goals listed above for carcinogens and non-carcinogens will also meet the chemical-specific applicable or relevant and appropriate requirements for this site.

TABLE 4

HAZARDOUS SUBSTANCES FOUND IN THE GROUNDWATER
AT THE NATIONAL STARCH SITE

CARCINOGENS	HIGHEST CONC. FOUND ON SITE	10^{-6} EXCESS CANCER RISK	CURRENT MCL
Arsenic	310 ppb	0.02 ppb	10 ppb
Benzene	8 ppb	1.2 ppb	5 ppb
Bis(2-chloroethyl) ether	14,000 ppb	0.03 ppb	none
Bromodichloromethane	7 ppb	0.43 ppb	none
Chloroform	49 ppb	0.43 ppb	none
1,2-dichloroethane	350,000 ppb	0.38 ppb	5 ppb
1,1-dichloroethylene	11 ppb	0.06 ppb	7 ppb
Methylene chloride	8 ppb	5.0 ppb	none
1,1,2-trichloroethane	11 ppb	0.59 ppb	none
Trichloroethylene	10 ppb	3.0 ppb	5 ppb
Vinyl chloride	90 ppb	0.02 ppb	2 ppb

NON-CARCINOGENS	HIGHEST CONC. FOUND ON SITE	CONC. EQUIV. TO R_fD OR ACI	CURRENT MCL
Acetone	89,000 ppb	3,500 ppb	none
Barium	2,290 ppb	1,800 ppb	1,000 ppb
Beryllium	120 ppb	17.5 ppb	none
Cadmium	114 ppb	10 ppb	10 ppb
Chromium	554 ppb	175 ppb	50 ppb
1,2-dichloropropane	29,000 ppb	6 ppb	6 ppb *
Ethyl benzene	1,500 ppb	3,500 ppb	680 ppb *
Manganese	1,400,000 ppb	7,700 ppb	none
Nickel	5,190 ppb	350 ppb	none
4-nitrophenol	13,000 ppb	350 ppb	none
Selenium	274 ppb	105 ppb	10 ppb
Toluene	6,000 ppb	2,000 ppb	2,000 ppb *
Xylenes	3,800 ppb	350 ppb	440 ppb *
Zinc	14,900 ppb	7,350 ppb	none

* = Proposed Maximum Contaminant Level Goal (MCLG)

The State of North Carolina has belatedly identified groundwater cleanup levels more stringent than those identified above. These cleanup goals can be found in North Carolina Administrative Code, Title 15, Department of Natural Resources and Community Development, Environmental Management Division, Subchapter 2L - Classifications and Water Quality Standards Applicable to the Groundwaters of North Carolina - Sections .0100, .0200 and .0300. The Agency will initiate discussions with the State to determine if these standards are applicable to the site. Even if these more stringent cleanup levels are found to be applicable, they would not alter the remedial action selected for this operable unit.

4.2 SURFACE WATER/SEDIMENT MONITORING

Surface water and sediment contamination have been detected in on-site streams in unacceptably high concentrations. The source of this contamination has not been determined. A supplemental RI to support a source control operable unit will be conducted to determine if a source, other than the trench area, exists. If other source(s) are found, they will be remediated in the source control operable unit. The groundwater extraction system will be designed to remediate contaminated groundwater throughout the plume and to prevent offsite migration of contaminated ground water. Surface water and sediment sampling will be conducted to determine the source of the contamination, and to verify that contamination has not migrated to offsite surface water and sediments.

5.0 ALTERNATIVES EVALUATION

The purpose of this remedial action at the National Starch Site is to mitigate and minimize contamination in the groundwater and to reduce potential risks to human health and the environment.

Groundwater

An initial screening of possible technologies was performed to identify those which best meet the criteria of Section 300.68 of the National Contingency Plan (NCP) (Table 5) and which satisfies the statutory criteria of SARA Section 121.

Following the initial screening of technologies, potential remedial action alternatives were identified and analyzed. These alternatives were further screened and those which best satisfied the cleanup objectives and applicable or relevant and appropriate requirements (ARARs) were developed for consideration (Table 6).

TABLE 5

ound Water neral Response ion	Remedial Technology	Process Option	Effectiveness	Implementability	Cost	Status
ction	None	Not Applicable	Does not unsure achievement of remedial action objectives	N/A; will likely require long-term monitoring	Low O&M (long-term monitoring)	Retained
itutional ns	Access restrictions	Deed restrictions	Effectiveness depends on continued future implementation; does not reduce contamination	Legal requirements	Negligible	Retained
	Alternative water supply	New community well	Effective in preventing use of contaminated groundwater; no contamination reduction	N/A	Moderate capital, low O&M	Dismissed
	Monitoring	Groundwater monitoring	Useful for documenting conditions; does not mitigate contamination	Easily implemented; serves to monitor contamination, not mitigate contamination	Low capital, low O&M	Retained
ontainment	Vertical barriers	Slurry wall	Not feasible because groundwater is contaminated within the fractured bedrock	Difficult to verify continuity of slurry or backfill	High capital, low O&M	Dismissed
		Grout curtain	Not effective because of fractured bedrock	Difficult to verify continuity of wall; must tie into impervious zone	High capital, low O&M	Dismissed
		Sheet pile	Not effective because of fractured bedrock	Difficult to key to bedrock; no excavation required; limited to 50 feet	High capital, low O&M	Dismissed
	Horizontal barriers	Grout injection	Not effective because of fractured bedrock	Continuity is difficult to verify	High capital, low O&M	Dismissed

TABLE 5

Ground Water General Response tion	Remedial Technology	Process Option	Effectiveness	Implementability	Cost	Status
		Steam stripping	Effective for removal of volatile organics; not applicable to inorganics	Because of high chloride, content equipment may require alloy materials for construction	Moderate capital, high O&M	Dismissed
		Evaporation	Effective if properly designed	Would require bench-scale testing and continued O&M	High capital, high O&M	Dismissed
		Reverse osmosis	Effective in concentrating salts in wastewater; may be considered as a pretreatment step	Readily implemented; membranes may foul if solubility limits are exceeded	High capital, moderate O&M	Dismissed
		Filtration	Effective in reducing suspended solids prior to further treatment	Readily implemented	Low capital, moderate O&M	Retained
		Carbon adsorption	Not effective for inorganic contaminants; not as effective for water soluble compounds	Readily implemented	High capital, high O&M	Retained
	Biological treatment	Biological degradation	Effective under good process control conditions	Readily implemented using conventional equipment O&M	Low capital, moderate	Retained

TABLE 5

Ground Water General Response Action	Remedial Technology	Process Option	Effectiveness	Implementability	Cost	Status
Collection treatment discharge	Extration	Extraction wells/deep well system	Effectiveness can be verified by monitoring; performance is sensitive to design; collected water must be treated or disposed of	Easily implemented; continued O&M required	Moderate capital, moderate O&M	Retained
	Subsurface drains	Interceptor trenches	Effective for downgradient fracture flow interception	Very difficult to implement; requires deep trenching through rock	High Capital, low O&M	Dismissed
	Physical-chemical treatment	Neutralization	Effective and reliable for stabilizing pH of groundwater prior to treatment	Readily implemented	Low capital, moderate O&M	Retained
		Precipitation/ Flocculation	Effective and relaible; requires sludge disposal	Readily implemented	Moderate capital, moderate O&M	Retained
		Ion exchange	Not an optimum process when dealing with saline water conditions that exist at site	Groundwater would require pretreatment before implementing this option	High capital, high O&M	Retained
		Air stripping	Effective for removal of volatile organics; not applicable to inorganics	Easily implemented; existing aeration basins on-site may be applicable	Moderate capital moderate O&M	Retained

TABLE 5

Ground Water General Response Action	Remedial Technology	Process Option	Effectiveness	Implementability	Cost	Status
Collection Treatment Discharge (continued)	Treatment in existing lagoons	Effective in air stripping volatile organics may be efficient bioreactors	Readily implemented, will require testing	Low capital, moderate O&M	Retained	
	In situ treatment	Biolegradation	Not effective in fractured bedrock and saline water conditions	Not easily implemented; requires bench-scale testing; would require numerous wells for injection	High capital, moderate O&M	Dismissed
		Chemical treatment	Not effective in fractured bedrock	Not easily implemented; would require numerous wells for injection	High capital, high O&M	Dismissed
	On-site discharge	Local stream	Effective and reliable	Not easily implemented; NPDES permit required	High capital, high O&M	Retained
	Off-site discharge	RCRA facility	Effective and reliable, but requires transportation	Permits required	High capital, low O&M	Retained
		Sewer line/POTW	Effective and reliable	Readily implemented through existing sewer line to POTW if pretreatment standards are met	Low capital, moderate O&M	Retained

TABLE 6

GROUNDWATER ALTERNATIVES

ALTERNATIVE	REDUCES MOBILITY/TOXICITY/VOLUME	COST
Alternative 1 No Action Long-term GW monitoring	Minor Reductions in contaminant volume, will require an extended time period	$220,000
Alternative 2 GW recovery Off-site disposal at a RCRA approved facility	Provides permanent and significant reductions in M/T/V	$103,601,000
Alternative 3 GW recovery Direct Discharge to POTW	Provides permanent and significant reductions in M/T/V	$781,000
Alternative 4 GW recovery Pre-treatment/air stripping A. Discharge to POTW B. Discharge to Grants Creek	Provides permanent and in M/T/V	significant reductions A. $7,104,00 B. $8,522,0
Alternative 5 GW recovery Pre-treatment A. Metals removal B. Air stripping, metals removal Lagoon Discharge to POTW	Provides permanent and significant reductions in M/T/V	A. $3,014,00 B. $3,726,00

M - mobility
T - toxicity
V - volume

Short-term impacts to human health and the environment involve increased traffic from tanker trucks. This alternative permanently remediates the groundwater, but does not satisfy the statutory preference for treatment to the maximum extent practicable.

Present Worth: $103,623,000.00

ALTERNATIVE 3: GROUNDWATER EXTRACTION AND DISCHARGE DIRECTLY TO POTW

This alternative involves extracting the contaminated groundwater and discharging it to the Salisbury POTW for treatment. The POTW is a 5 million gallon per day biological treatment plant. Bench-scale testing may be required by the POTW to determine if the POTW is capable of treating this contaminated groundwater.

National Starch currently discharges plant wastewater effluent to a sewer line connected to the POTW.

The extracted groundwater would be discharged into the existing sewer line.

The discharge to the Salisbury POTW will have to be negotiated with the City of Salisbury.

Groundwater will be extracted until the groundwater at the site meets the ARARs established for this site throughout the plume area(s). There are no short-term impacts to human health or the environment from this alternative. Long-term effects include restoring contaminated groundwater onsite for potential beneficial use, prevention of offsite migration of contaminated groundwater, and prevention of offsite migration of contaminated surface water and sediments which might be related to groundwater discharge. This groundwater alternative meets the statutory preference for treatment to the maximum extent practicable and for permanent remediation. Discharge of effluent from the POTW will be in accordance with the POTW's NPDES permit. This alternative meets ARARs.

Present Worth: $781,000.00

ALTERNATIVE 4: GROUNDWATER EXTRACTION, PRE-TREATMENT BY AIR STRIPPING/METALS REMOVAL, DISCHARGE TO POTW OR TO GRANTS CREEK

In this alternative, the groundwater will be extracted, treated to meet acceptable effluent limits of the POTW, once negotiated, then discharged to the POTW, or discharged to Grants Creek in compliance with a NPDES permit.

The treatment process will include pH adjustment, precipitation, flocculation, and clarification for metals removal. Air stripping with fume incineration followed by biotreatment will be used to remove the HSL organics, and to reduce COD and BOD. The process will be designed to meet all pretreatment requirements for producing a final effluent suitable for discharge to the Salisbury POTW.

This alternative has the same short and long term impacts as Alternative 3. This groundwater alternative meets the statutory preference for treatment to the maximum extent practicable and for permanent remediation. This alternative meets ARARs.

Groundwater will be extracted until the groundwater at the site meets the ARARs established for this site throughout the plume area(s).

Present Worth: $7,104,000.00

ALTERNATIVE 5: GROUNDWATER EXTRACTION, PRE-TREATMENT IN EXISTING LAGOON SYSTEM, DISCHARGE TO POTW

This alternative includes the extraction of groundwater and pretreatment as required to allow the groundwater to be combined with the current plant effluent prior to treatment and treated in the existing lagoons for discharge to the Salisbury POTW. The level of pretreatment required will depend on the effluent limits set by the POTW.

The pretreatment system may include metals removal by lime precipitation, stripping of volatile organics, or treatment with activated carbon. If stripping of volatile organics is required, air monitoring will be instituted, and carbon filter units used as necessary to address potential air emissions. Activated carbon used to prevent air emissions or as a treatment process for contaminated groundwater will be incinerated or regenerated, whichever is most cost-effective.

This alternative has the same short and long term impacts as Alternative 3. This groundwater alternative meets the statutory preference for treatment to the maximum extent practicable and for permanent remediation. This alternative meets ARARs.

Groundwater will be extracted until the groundwater at the site meets the ARARs established for this site throughout the plume area(s).

Present Worth: $3,036,000.00

6.0 RECOMMENDED ALTERNATIVES

6.1 COMPARISON OF ALTERNATIVES

Alternative 1, no Action alternative which must be considered as a base line for comparison (SARA Section 121), does not meet ARARs, and does not satisfy the statutory criteria, nor to the extent practicable, the NCP. Alternative 2, provides for removal of a principle threat from the site, but not for remediation of contaminated groundwater. It does not satisfy the statutory preference for treatment for the maximum extent practicable.

Alternatives 3, 4 and 5 differ principally in the range of pretreatment provided for contaminated groundwater before release to the Salisbury POTW. Alternative 3, provides for no pretreatment which allows no flexibility should the Salisbury POTW bench-scale test (see discussion on Alternative 3) indicate that pretreatment would be necessary for discharge of the groundwater directly to the POTW. Therefore, this alternative may fail to meet the remediation goals specified within the ROD. Alternative 4, provides for discharge to the POTW or Grants Creek after pretreatment, and is equivalent to Alternative 5 in protectiveness. However, Alternative 5, which specifies pretreatment as necessary with discharge to Salisbury POTW does not require an additional NPDES permit.

6.2 DESCRIPTION OF RECOMMENDED REMEDY

The recommended alternative (Alternative 5) for remediation of groundwater is to install a groundwater interception and extraction system downgradient of the source area(s). The level and degree of pretreatment of the extracted groundwater will depend on the effluent limits set by the POTW. The range of pretreatment for the extracted groundwater includes air stripping, filtration through activated carbon filter, metal removal, and treatment through the company's existing lagoon system. The extracted groundwater will be discharged to the Salisbury POTW. Groundwater remediation will be performed until all contaminated water meets cleanup goals specified in Section 4 throughout the plume area(s).

In the possibility that a mutual arrangement cannot be reached between National Starch & Chemical Corporation and the POTW to accept the extracted groundwater, treated or untreated, the extracted groundwater will be discharged to a local surface stream under a NPDES permit.

A monitoring program will be established for surface water and sediment. Additional soil samples will be collected in the vicinity of surface water and in the vicinity of any suspected source area(s) to determine if other source(s), other than the trench area, are responsible for the surface water and sediment contamination found. The surface water and sediment monitoring will continue until cleanup goals have been met.

The recommended alternative meets the requirements of The National Oil and Hazardous Substances Contingency Plan (NCP), 40 CFR 300.68 (j), and the Superfund Amendments and Reauthorization Act of 1986 (SARA). This remedy permanently and significantly reduces the potential threat due to groundwater contamination at the site through reduction of toxicity, mobility, and volume of contaminants, and utilizes treatment technologies to the maximum extent practicable for this operable unit.

6.3 OPERATION AND MAINTENANCE

After this operable unit is completed, no long term operation and maintenance for groundwater will be required other than monitoring requirements.

6.4 COST OF RECOMMENDED ALTERNATIVE

Capital costs for groundwater remediation is $597,000 with system operating and maintenance cost at $55,000 per year, which includes sampling and analysis. The total present worth of the groundwater remediation is $1,001,000.

6.5 SCHEDULE

The planned schedule for remedial activities at the National Starch Site will be governed by the signing of the Consent Decree and the finalization of the site on the NPL, but tentatively is as follows:

September 1988- Approve Record of Decision
January 1989- Sign Consent Decree
February 1989- Begin Remedial Design
July 1989- Complete Remedial Design
August 1989- Begin Mobilization

6.6 FUTURE ACTIONS

Groundwater, surface water and sediment monitoring will be required throughout this remedial action to monitor the achievement of cleanup goals. A supplemental RI (remedial investigation) consisting of soil sampling to identify additional source area(s) and associated pathways for surface water and sediment contamination will be initiated during remedial design. A subsequent source control operable unit addressing soils, and as necessary, sediments, will provide further site remediation to address any principal threat from ingestion of or dermal contact with contaminated soils or sediments.

6.7 CONSISTENCY WITH OTHER ENVIRONMENTAL LAWS

Remedial actions performed under CERCLA must comply with all applicable or relevant and appropriate Federal and State environmental regulations. All alternatives considered for the National Starch Site were evaluated on the basis of the degree to which they complied with these regulations. The recommended alternative was found to meet or exceed all applicable or relevant and appropriate requirements as discussed below:

* Clean Water Act
  Contamination was detected in surface water and sediment samples on-site.

* Safe Drinking Water Act

  Maximum Contaminant Levels (MCLs) established under the Safe Drinking Water Act were found to be relevant and appropriate to remedial action at the National Starch Site. The cleanup goals for groundwater were established in Section 4.

* Endangered Species Act

  The recommended remedial alternative is protective of species listed as endangered or threatened under the Endangered Species Act. Requirements of the Interagency Section 7 Consultation Process, 50 CFR, Part 402, will be met. The Department of the Interior, Fish and Wildlife Service will be consulted during remedial design to assure that any endangered or threatened species are not adversely impacted by implementation of this remedy.

* Clean Air Act (Ambient Air Quality Standards)

  The groundwater treatment systems will be designed and monitored to assure that air emissions meet all local, State and Federal standards.

7.0 COMMUNITY RELATIONS

Fact sheets were transmitted in February 1987, to interested parties, residents near the Site, media and state, local and federal officials before the RI work began at the Site.

An information repository was established at the Rowan County Library in Salisbury, North Carolina.

A public meeting was held on April 2, 1987, at the Civic Center in Salisbury to discuss the RI/FS activities and to introduce Superfund to the community.

Another public meeting was held on March 31, 1988, at the Civic Center in Salisbury to discuss the results of the RI.

The final public meeting was held on September 14, 1988, at the Civic Center in Salisbury to discuss the alternatives from the Feasibility Study and describe EPA's preferred remedial alternative. The three-week public comment period ended on September 24, 1988. The Proposed Plan fact sheet was distributed to the public, including the Information Repository, in September 1988.

A Responsiveness Summary has been prepared to summarize community concerns and EPA's community relations activities.